ABSTRACT

The development of subunits and subunit analogs of the <u>Bordetella</u> exotoxin by recombinant DNA techniques provides vaccine products that retain their biological activity, are highly immunogenic, and can confer protection against disease challenge.

Genetically-engineered modifications of the subunits can result in products that retain immunogenicity, yet are free of enzymatic activity associated with toxin of reactogenicity.